



PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE HONORABLE BOARD OF PATENT APPEALS AND INTERFERENCES

In re the Application of

Makoto MIYAMOTO et al.

Group Art Unit: 1756

Application No.: 10/656,337

Examiner: M. ANGEBRANNDT

Filed: September 8, 2003

Docket No.: 117051

For: INFORMATION-RECORDING MEDIUM

REPLY BRIEF

Commissioner for Patents
P.O. Box 1450
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Sir:

The following remarks are directed to the new points of argument raised in the Examiner's Answer dated February 23, 2007 and the Supplemental Examiner's Answer dated April 13, 2007.

I. Response to Examiner's Answer

A. Figure 1 of the Appeal Brief

Data relating to the compositions taught by Kojima was not included in Fig. 1 of the Appeal Brief because the Patent Office agreed that Kojima fails to disclose any composition that corresponds to the compositions of claim 1 (see, *e.g.*, Examiner's Answer, page 4, line 4). Data shown in Fig. 1 of the Appeal Brief relating to Kimura '741 was not intended to be included and is not relevant to the rejection on appeal.

Please see Fig. 1 below, which more clearly shows the composition range of claim 1, the single composition of Kojima, and the composition areas of Yamada.

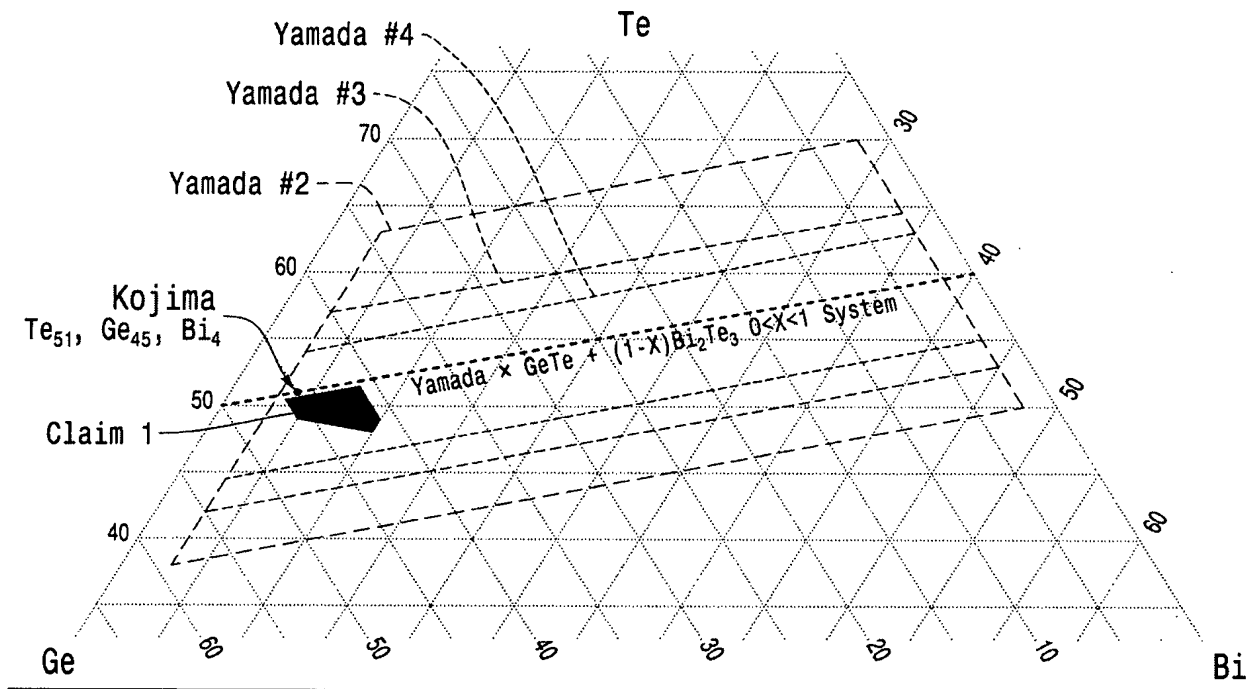


Figure 1

B. Mischaracterization Of Appellants' Arguments

The Examiner's Answer, citing to page 12, lines 19-22 of the Appeal Brief, mischaracterizes Appellants' arguments (Examiner's Answer, page 5, line 21 to page 6, line 2). The Patent Office alleges that it would have been obvious to modify the recording media of Kojima with compositions from Yamada because the compositions of Yamada and Kojima have a small shift in composition (see, *e.g.*, Examiner's Answer, page 5, lines 11-19, especially lines 15-16). However, the alleged combination is improper because one of ordinary skill in the art would not have been motivated to modify the recording media of Kojima with any of the compositions disclosed by Yamada. In contrast to the Patent Office's position, the relationship between Yamada's compositions and Kojima's composition cannot be characterized as a small shift. Kojima discloses only a single composition ($\text{Te}_{51}\text{Ge}_{45}\text{Bi}_4$) whereas Yamada's composition areas encompass large swaths of the TeGeBi ternary diagram (see Fig. 1). Thus, one of ordinary skill in the art, viewing the disclosures of Yamada and Kojima together, would know that the majority of compositions defined by Yamada's

composition areas have a large variation from Kojima's composition. Because Yamada discloses composition areas and not specific compositions, any difference between the compositions of Yamada and the composition of Kojima must be measured for a composition area of Yamada as a whole. Thus, the allegation in the Examiner's Answer that it would have been obvious to use Yamada's compositions in place of Kojima's composition because there is a "small shift" in composition is incorrect.

C. The Patent Office Fails To Establish A Prima Facie Case Of Obviousness

1. The Patent Office Fails To Establish Any Motivation To Combine

A prima facie rejection of obviousness requires that the Patent Office establish (1) a suggestion or motivation to combine, (2) a reasonable expectation of success, and (3) that all claim limitations are taught or suggested. The Patent Office has failed to meet this burden because the Patent Office has never alleged any motivation to combine.

The Examiner's Answer alleges it would have been obvious to use a composition from Yamada's #4 composition area (Yamada, Table 2) in the recording medium of Kojima with a reasonable expectation of forming a useful optical recording medium (Examiner's Answer, page 3, lines 17-22). Because an allegation of reasonable expectation of success goes only to the second prong of the test, no motivation to combine has been alleged.

The Examiner's Answer further alleges that a substitution in the recording medium of Kojima by a composition disclosed by Yamada "would have been obvious ... due to the small shift in composition" (page 5, lines 11-19). As discussed above, this allegation is improper. However, even if there was only a small shift in the compositions, the Examiner's Answer has not provided any statement of why one of ordinary skill would have been motivated to perform the alleged substitution. Kojima fails to disclose that there is any problem with its disclosed recording level composition which would be solved by using a composition of Yamada. Yamada also fails to disclose that the composition of Kojima has any problem.

Further, as discussed in greater detail below, the teachings of Yamada fail to indicate that any of Yamada's compositions would be preferable to that of Kojima (however, as discussed below, Yamada indicates that the compositions in the $x\text{GeTe} + (1-x)\text{Be}_2\text{Te}_3$ system, which is outside of the composition region of claim 1, is better than the composition areas which include the composition disclosed by Kojima). Even if the combined teachings of the applied references supported the allegation that a small shift existed between the composition of Kojima and the disclosed composition areas of Yamada, such a "small shift" is, by itself, not motivation or suggestion to combine without any additional information indicating the combination would be preferable. Such additional information is not present in the applied references.

The Patent Office's sole basis for alleging obviousness appears to be that it would have been obvious to try alternate compositions because the resulting recording layer might be preferable. This does not meet the requirements for a *prima facie* case of obviousness. *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988) (a prior art suggestion for virtually endless experimentation is not a case of *prima facie* obviousness).

The proper inquiry for an obviousness rejection is whether one of ordinary skill in the art, provided with the prior art taken as a whole, would have been motivated to produce the proposed combination. Kojima is directed to the composition of a recording medium having a thickness of 11 nanometers (nm) (col. 58, line 4). This recording medium is able to be recorded on and erased with powers of 5.2 mW and 2.0 mW, respectively (col. 58, Table 11). In contrast, the recording layer compositions of Yamada are disclosed as having a thickness of 100 nm (page 10, line 25), and require powers of 8-15 mW to record on and 5-8 mW to erase (Table 2). Thus, based on the disclosures of Yamada and Kojima, one of ordinary skill in the art would have understood that the compositions of all the areas taught by Yamada are inferior to the composition taught by Kojima. Therefore, one of ordinary skill would not have

been motivated to substitute any composition of Yamada in the recording layer of Kojima because one of ordinary skill in the art would have understood that the compositions of Yamada, placed in the recording layer of Kojima, would have resulted in an inferior recording medium.

Accordingly, a *prima facie* case of obviousness has not been made.

2. Yamada Teaches Away From The Proposed Combination

Yamada, in Table 2, lists several composition ranges for an optical recording layer which are ranked based on their utility. The composition of rank 1 is the composition defined by the line shown in Fig. 1(b). This composition is mathematically defined by Yamada as $x\text{GeTe} + (1-x)\text{Bi}_2\text{Te}_3$ for $0 < x < 1$ (Fig. 1(b); page 7, line 16). Yamada indicates this composition has the best utility (Table 2; page 15, lines 12-15). The other composition areas disclosed by Yamada at each successively lower rank (lower utility) cover greater ranges around the $x\text{GeTe} + (1-x)\text{Bi}_2\text{Te}_3$ system (see Fig. 1 herein; Yamada, Table 2). The composition listed at rank 2 of Table 2 is able to perform 1 million cycles of recording and erasures at a maximum rotational speed of 25 m/sec (page 16, lines 2-4). The composition listed at rank 3 of Table 2 is capable of 100,000 cycles of recording and erasure at a maximum speed of 15 m/sec (page 16, lines 1-2). The composition listed at rank 4 (the worst utility) is capable of only 10,000 cycles of recording and erasure at a maximum speed of 5 m/sec (page 15, line 24 to page 16, line 1).

The PTO has alleged that the composition of rank 3 corresponds to the composition range of claim 1 (March 2, 2006 Final Rejection, section 4). The Examiner's Answer now alleges that the composition of rank 4 corresponds to the composition range of claim 1 (page 5). Because Yamada indicates that the composition area of rank 4 comprises the composition of the worst utility (Table 2), it follows that one of ordinary skill would not have been motivated to select this composition over that of rank 1, the $x\text{GeTe} + (1-x)\text{Bi}_2\text{Te}_3$ system.

The PTO's allegation that one of ordinary skill would have been motivated to use this composition over other compositions disclosed by Yamada which do not cover the compositions of claim 1, but which Yamada discloses as being superior recording media, is thus using Appellants' disclosure in improper hindsight instead of technological logic.

3. **Even If The Proposed Combination Is Made, One Of Ordinary Skill In The Art Would Have Chosen A Composition From The $x\text{GeTe} + (1-x)\text{Bi}_2\text{Te}_3$ System**

Even if the proposed combination of modifying the recording layer of Kojima by using a composition taught by Yamada, the claimed recording layer composition would not be taught. As discussed above, Yamada discloses that the compositions on the line defined by the $x\text{GeTe} + (1-x)\text{Bi}_2\text{Te}_3$ system (the rank 1 composition of Table 2) is the composition range having the best recording layer characteristics. Thus, even if one of ordinary skill were to modify the recording layer of Kojima to include a composition as taught by Yamada, one of ordinary skill would have selected a composition from the line defined by $x\text{GeTe} + (1-x)\text{Bi}_2\text{Te}_3$ because, as taught by Yamada, these compositions yield the best recording layer characteristics. Neither Kojima, nor Yamada, disclose or suggest choosing a composition that deviates from the $x\text{GeTe} + (1-x)\text{Bi}_2\text{Te}_3$ line. Thus, the Final Rejection appears to have impermissibly used Appellants' disclosure as a roadmap to suggest the proposed modification of Kojima by Yamada.

Accordingly, a *prima facie* case of obviousness has not been made.

4. **Appellants' Claimed Composition Range Provides Unexpected Results**

Even if the proposed combination would be proper, Appellants' claimed composition range exhibits unexpected results. As disclosed in the specification, prior art recording layers exhibit high deterioration levels on the inner circumferential portion of the recording layer (specification, paragraphs [0020]-[0023] and [0025]-[0026]) as a result of the slower

rotational speed such as exhibited at the inner regions of recording discs. However, as a result of the development of the claimed composition range, Appellants have discovered a recording layer composition which simultaneously allows recording at 8.2 m/sec and 20.5 m/sec (paragraph [0038]). Thus, the claimed composition provides superior performance for linear velocities at both high and low levels such as exhibited in the outer and inner regions of a rotating recording medium. These advantageous properties are not disclosed by Yamada for any of Yamada's disclosed composition ranges.

Thus, even if the Patent Office has properly alleged a case of obviousness, the disclosed unexpected results indicate that claim 1 is patentable over the applied references.

II. CONCLUSION

For all of the reasons discussed above, it is respectfully submitted that the rejections are in error and that claim 1 is in condition for allowance. For all of the above reasons, Appellants respectfully request this Honorable Board to reverse the rejection of claim 1.

Respectfully submitted,



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JAO:JHB/axl

Date: May 15, 2007

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